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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/759,511   | 01/15/2004  | Hans W. Bruesselbach | B-4759NP 621649-7   | 7055             |
| 36716  | 7590        | 04/01/2005           | EXAMINER            |                  |
| LADAS & PARRY<br>5670 WILSHIRE BOULEVARD, SUITE 2100<br>LOS ANGELES, CA 90036-5679 |             |                      | PEACE, RHONDA S     |                  |
|  |             |                      | ART UNIT            | PAPER NUMBER     |
|  |             |                      | 2874                |                  |
| DATE MAILED: 04/01/2005  |             |                      |                     |                  |

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/759,511

Applicant(s)

BRUESSELBACH ET AL.

Examiner

Rhonda S. Peace

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 0504/0604/4004/410. 5/17/04 10/08/04 11/29/04 7/7/04
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4, 9-11, 18, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Harootian (US Patent 5,303,373).

As to Claim 1, Harootian teaches a plurality of optical fibers, each having a first and second end, whereby the fibers are bundled, fused, and tapered along their length, and providing a facet normal to the length of the fibers (col 2 lines 27-37), formed by means of cutting, polishing, or any similar method. (col 5 lines 41-43).

As to Claim 4, Harootian shows the device as described above, wherein the core diameter of each optical fiber in the tapered region is smaller than the core diameter of each optical fiber in the non-tapered region (col 2 lines 27-37).

As to Claim 9, Harootian shows the said device where the fibers comprising the fused section are uniformly stretched to provide a desired amount of coupling between the individual fibers (col 2 lines 38-56; col 6 lines 50-58). It is inherent that different amounts of stretch result in different degrees of coupling between fibers.

As to Claim 10, Harootian teaches the device of claim 1 wherein at least one optical fiber has a different core size from at least one other optical fiber (col 4 lines 8-16).

Art Unit: 2874

As to Claim 11, Harootian teaches a method of coupling light using a plurality of optical fibers, each having a first and second end, wherein the fibers are fused together along their length and tapered such that the core fiber diameters at the tapered end of the bundle are smaller than core fiber diameters at the untapered end of the bundle (col 4 lines 67-68 and col 5 lines 1-5; col 2 lines 23-27, 38-57). In addition, Harootian shows a facet formed by cleaving, or a method of the like (col 4 lines 17-19), the fiber normal to the fiber length, as well as illuminating the facet with light (col 4 lines 17-19).

Claims 18 and 19 are anticipated by the teachings of Harootian which describe a method where the fibers comprising the fused section are uniformly stretched to provide a desired amount of coupling between the individual fibers (col 2 lines 38-56; col 6 lines 50-58). It is inherent that different amounts of stretch result in different degrees of coupling between fibers. As well, Harootian discloses a method wherein at least one optical fiber has a different core size from at least one other optical fiber (col 4 lines 8-16).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harootian (US Patent 5,303,373) as applied to claims 1 and 11 above, and further in view of Basavanhally et al (US Patent 6,827,500). Basavanhally et al teaches a

Art Unit: 2874

plurality of optical fibers that are arranged in a hexagonal close packed array (figure 1; col 2 lines 11-15). The use of the teachings of Basavanhally et al with the device described above by Harootian would have been obvious to a person of ordinary skill in the art, as the hexagonal array described by Basavanhally et al minimizes unused space within the optical fiber bundle.

Claims 3 and 12, are rejected under 35 U.S.C. 103(a) as being unpatentable over Harootian (US Patent 5,303,373) as applied to claims 1 and 11 above, and further in view of Smith et al (US Patent 5,045,100). Harootian teaches the elements of claims 1 and 11, as discussed above. Smith et al discloses the use of a glass matrix for arrangement of optical fibers within a bundle (col 2 lines 51-55; col 1 lines 35-51). To one of ordinary skill in the art, it would have been obvious to couple the teachings of Harootian and Smith et al, for the purpose of uniformity. The use of a glass matrix is beneficial as it provides material continuity between all elements of the optical fiber bundle, ensuring the optical fibers will behave in an appropriate manner. Using dissimilar materials in the construction of the fiber bundle increase the possibility of structural instability and behavior malfunction during the fusing, tapering, and stretching process. Since glass is a common material in fiber construction, it would be obvious to one skilled in the art to use glass as the material for matrix construction for the reason stated.

Claims 7 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harootian (US Patent 5,303,373) in view of Smith et al (US Patent 5,045,100) as applied to claims 3 and 12 above, and further in view of Anthon et al (US Patent

Art Unit: 2874

6,411,762). Anthon et al discloses the use of a fluorosilicate glass matrix in the formation of optical fiber bundles (col 13 lines 1-16; figure A). Fluorosilicate offers a low refractive index doping agent, minimizing any light that may be passed from one optical fiber within the bundle to another. For this reason, it would have been obvious to one skilled in the art to use fluorosilicate as the specific glass matrix material.

Claims 5, 6, 8, 14, 15, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harootian (US Patent 5,303,373).

As to Claims 5 and 14, Harootian teaches the claimed device of where all individual optical fibers fit precisely from one side of the corresponding imaging device to the other side of the bundle (col 3 lines 3-11, 28-33). It would have been obvious to one skilled in the art that Harootian suggests a device that emits a plurality of pixels that correspond to individual fibers, this plurality of pixels then emitted as a single output from the device facet. As to Claims 6 and 15, Harootian shows the device described above as being coupled to two imaging devices, the nature of which is uncritical (col 4 lines 17-24; figure 1). It would have been obvious to one skilled in the art that devices wherein a single optical input is delivered to the facet of the fused portion of the bundle and distributed to each optical fiber within the bundle may be used with the fused fiber bundle to allow the facet to receive a single optical input traveling in free space wherein this single input is distributed amongst all optical fibers within the bundle. As to Claims 8 and 17, Harootian teaches the device as described above, wherein the diameter of the optical input at the unfused end of the given optical fiber is larger than the diameter

Art Unit: 2874

of the same optical input at the fused end of the given optical fiber (col 3 lines 34-43; col 2 lines 22-26).

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harootian (US Patent 5,303,373). Harootian discloses a plurality of optical fibers, each having a first and second end, whereby the fibers are bundled, fused, and tapered along their length, and providing a facet normal to the length of the fibers (col 2 lines 27-37), formed by means of cutting, polishing, or any similar method. (col 5 lines 41-43). Also, Harootian teaches the claimed device of where all individual optical fibers fit precisely from one side of the corresponding imaging device to the other side of the bundle (col 3 lines 3-11, 28-33). It would have been obvious to one skilled in the art that Harootian suggests a device that emits a plurality of pixels that correspond to individual fibers, this plurality of pixels then emitted as a single output from the device facet. As well, Harootian shows the device, wherein the diameter of the optical input at the fused end of the given optical fiber is smaller than the diameter of the same optical input at the unfused end of the given optical fiber (col 3 lines 34-43; col 2 lines 22-26).

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harootian (US Patent 5,303,373) as applied to claim 20 above, in further view of Basavanhally et al (US Patent 6,827,500). Basavanhally et al teaches a plurality of optical fibers that are arranged in a hexagonal close packed array (figure 1; col 2 lines 11-15). The use of the teachings of Basavanhally et al with the device described above by Harootian would have been obvious to a person of ordinary skill in the art, as the

Art Unit: 2874

hexagonal array described by Basavanhally et al minimizes unused space within the optical fiber bundle.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harootian (US Patent 5,303,373) as applied to claim 20 above, and further in view of Smith et al (US Patent 5,045,100). Smith et al discloses the use of a glass matrix for arrangement of optical fibers within a bundle (col 2 lines 51-55; col 1 lines 35-51). To one of ordinary skill in the art, it would have been obvious to couple the teachings of Harootian and Smith et al, for the purpose of uniformity. The use of a glass matrix is beneficial as it provides material continuity between all elements of the optical fiber bundle, ensuring the optical fibers will behave in an appropriate manner. Using dissimilar materials in the construction of the fiber bundle increase the possibility of structural instability and behavior malfunction during the fusing, tapering, and stretching process. Since glass is a common material in fiber construction, it would have been obvious to one skilled in the art to use glass as the material for matrix construction for the reason stated.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harootian (US Patent 5,303,373) in view of Smith et al (US Patent 5,045,100) as applied to claim 22 above, and further in view of Anthon et al (US Patent 6,411,762). Anthon et al discloses the use of a fluorosilicate glass matrix in the formation of optical fiber bundles (col 13 lines 1-16; figure A). Fluorosilicate offers a low refractive index doping agent, minimizing any light that may be passed from one optical fiber within the



Art Unit: 2874

bundle to another. For this reason, it would have been obvious to one skilled in the art to use fluorosilicate as the specific glass matrix material.

Claims 23, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harootian (US Patent 5,303,373). As to claim 23, Harootian shows the device of claim 20 wherein the core diameter of each optical fiber in the tapered region is smaller than the core diameter of each optical fiber in the non-tapered region (col 2 lines 27-37). As to Claim 25, Harootian shows the said device where the fibers comprising the fused section are uniformly stretched to provide a desired amount of coupling between the individual fibers (col 2 lines 38-56; col 6 lines 50-58). It is inherent that different amounts of stretch result in different degrees of coupling between fibers. As to Claim 26, Harootian teaches the device of claim 20 wherein at least one optical fiber has a different core size from at least one other optical fiber (col 4 lines 8-16).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited US Patents to Anthon et al (6,477,301) and Hudson (3,912,362) show other related fused, tapered optical bundles.

All of the prior art cited by the applicant in the Information Disclosure Statements filed on May 17, 2004, July 7, 2004, October 8, 2004, and November 29, 2004 have been considered and made of record. Note the attached initialed copy of form PTO-1449.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

Art Unit: 2874

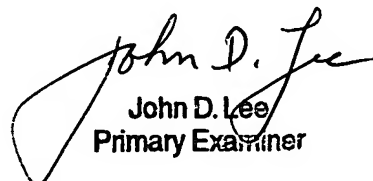
the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rhonda S. Peace whose telephone number is (571) 272-8580. The examiner can normally be reached on M-F (8-5pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272- 2344.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Rhonda S. Peace  
Examiner  
Group Art Unit 2874

  
John D. Lee  
Primary Examiner